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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,160	08/18/2003	Dmitry M. Rudkevich	124263-1016	3568

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EXAMINER

DRODGE, JOSEPH W

ART UNIT	PAPER NUMBER
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1723

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/643,160

Applicant(s)

RUDKEVICH, DMITRY M.

Examiner

Joseph W. Drodge

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn. The finality is withdrawn and new references applied to the claims due to the Affidavit Submitted with the Response of February 23, 2006

The Affidavit filed on February 27, 2006 under 37 CFR 1.131 is sufficient to overcome the previously applied Zyzranov publication/reference.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-18 are rejected under 35 U.S.C. 102(a) as being anticipated by Internet Publication of record as submitted by applicant by the publication by Zyryanov et al entitled "Supramolecular fixation of NO₂ with Calix[4]Arenes", published on the Internet 25th October 2002.

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Zyryanov et al disclose a calyx[4]arene compound that forms a complex with NO⁺ cations, wherein the NO⁺ may be any of various oxides of nitrogen and derived from a large variety of atmospheric substances, fossil fuels, power plants and large-scale industrial processes (1st paragraph of page 2792).

With regard to each of independent claims 1, 11, 15 and 16, the limitation "wherein NO⁺ is derived from an oxide of nitrogen in a form other than nitric oxide" is considered a product-by-process limitation, and now deemed to be of limited patentable weight, since no nexus is seen between particular processes that result in the presence of NO⁺ contaminants in fluids and properties of the calixarene compounds utilized to sense, contain or purify NO⁺ from fluid mixtures containing same.

When the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) and *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP § 2113.

When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

For claims 1-10, the reaction between the NO⁺ cation and arene is detectable by color change (3rd paragraph of page 2792).

For claim 2, the color change is detectable by at either visualization or spectroscopy (4th and 3rd paragraphs of page 2792).

For claim 3, page 2793, 2nd column teaches disassociation.

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For claim 4, the detected color change is suggested as optionally going to a colorless condition (page 2792, 2nd column).

For claim 5, both cone and 1, 3 alternate configuration of arene molecule are taught in paragraphs bridging pages 2792, 3rd paragraph.

For claim 6, page 2793, 2nd column teaches encapsulation, i.e. "fixation" or immobilization of the complex, also see figure 1.

For claim 7, the introduction teaches the NO⁺ compounds in a solution of gas or liquid (pg. 2792, 4th paragraph).

For claims 8 and 13 and also 16-18, the complex forms a molecular container, or storage device (page 2792, 3rd paragraph).

For claims 9 and 12 and also 18, figure 2 suggests use of substrates for cation transfer.

For claim 10, stabilizing with Lewis Acids are taught at page 2792, introductory paragraph.

For claims 11 and 15, the forementioned fixation, necessarily concerns removal of the cations from air or liquid, hence purifying such air or liquid, also see page 2792, 2nd paragraph concerning .

For claim 14, chemical stability is an inherent property of the disclosed "fixation" and "encapsulation".

For claim 15, the 2nd paragraph at page 2992 concerns simultaneous exposure of calixerenes to plural types of oxides of nitrogen in the air and removing at least NO₂, hence to chemical purifying of a mixture of oxides of nitrogen.

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Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Lamartine et al patent 6,136,071. Lamartine et al, of record, discloses devices employing calix[4]arene compounds (column 5, about line 40), that may be used to purify fluid streams containing nitrogen-containing substances (column 2, lines 32-37). The devices form complexes with captured contaminants (column 5, lines 19-21). Regarding various dependent claim, Lamartine also discloses the calixarene being coupled to a substrate or solid support (Abstract), and its forming a storage device (column 4, lines 46-47 concerns it's capturing nitrogen-containing compounds).

The limitations of the instant claims pertaining to association with a particular nitrogen-containing compound (NO⁺), detection of color changes, complexing being stabilized with Lewis Acids, and deriving of NO⁺ from an oxide of nitrogen in a form other than nitric oxide have each been given little patentable weight, since no nexus is seen between particular processes that result in the presence of NO⁺ contaminants in fluids and properties of the calixerene compounds utilized to sense, contain or purify NO⁺ from fluid mixtures containing same.

When the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) and *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP § 2113.

When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batelaan et al patent 5,434,208 in view of either Holdcroft et al patent 5,561,030 or Smith et al patent 6,605,236.

Regarding claims 19 and 20, Batelaan et al patent 5,434,208 discloses an optical waveguide or optical switch (column 1, lines 29-32), comprising calix[4]arene (column 3, lines 24-26). The calyx[4]arene may be complexed with nitrogen-containing compounds (column 5, lines 15-31).

The claims 19 and 20 differ in requiring the complexing to be with a nitrosonium cation. However, both Holdcroft et al (column 13, lines 30-35 and column 14, lines 63-67) and Smith et al (column 1, lines 33-35 and column 2, lines 40-63) teach combinations/co-polymers/complexes of materials useable for creating optical switches that contain nitrosonium complexes. It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a nitrosonium cation as the

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nitrogen-containing compound being complexed to the calixarene of the Batelaan optical switch, as taught by Holdcroft et al or Smith et al, since nitrosonium has the beneficial properties of imparting controlled conductivity or semiconductivity to the optical switch or similar type articles.

The claimed deriving of NO⁺ from an oxide of nitrogen in a form other than nitric oxide have each been given little patentable weight, since no nexus is seen between particular processes that result in the presence of NO⁺ and their derivation into a nitrosonium ion and any particular, unique or distinguishable property of the optical switch device claimed.

When the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) and *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP § 2113.

When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can be reached at 571-272-1151. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

March 4, 2006


JOSEPH DRODGE
PRIMARY EXAMINER